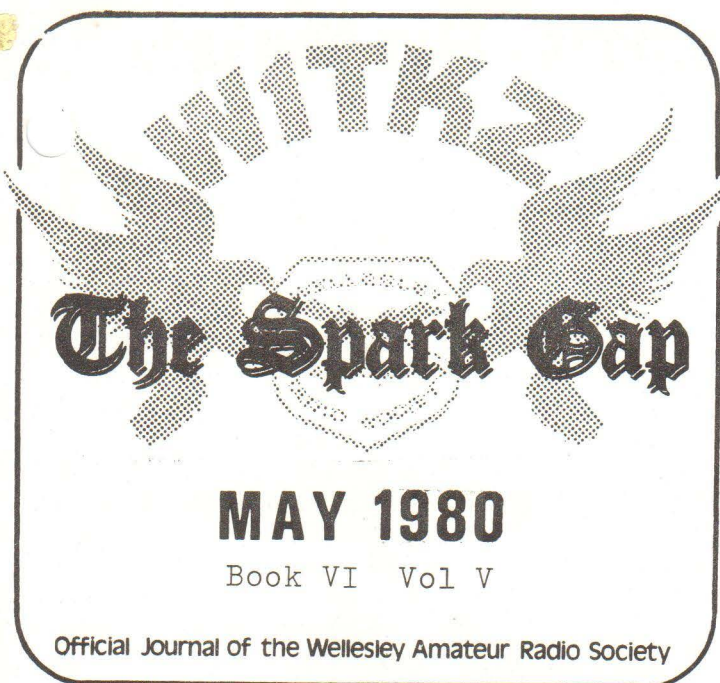




Hearabouts....

Enclosed at the end of this issue is a ballot for absentee voting for club officers for the next club year, running September 1, 1980 through August 31, 1981. Voting will take place at the May 15th meeting, but if you cannot make this meeting for any reason, please be sure to send your absentee ballot to arrive before May 15 to the club address: Wellesley Amateur Radio Society, 324 Washington Street, Wellesley Hills, Mass. 02181. □

ACTIVITIES

Our annual auction took place on Saturday, April 12th. With nice weather a good crowd was in attendance and a large number of items were sold both at auction and at the bargain table for items under \$5.00

Final results are not yet in, but it is expected that our income will be somewhat less than last year which has been the general pattern due to the increased number of clubs sponsoring auctions and flea markets in the area.

Still it would appear that we did quite well.

A good group of club members was on hand to speed the work along and to enjoy the pizza party afterwards.

A special thanks to our auctioneers Joe Borrow, K1GFH, and Eric Poole, WA1RKT, and to the many businesses who contributed a raffle prize.

Full details on the profits of the auction will be available at the upcoming regular club meetings. □

SILENT KEY

We are sorry to inform you of the passing of Charlie Chabot, WA1GBF. It came quite suddenly the day after our meeting of April 3rd from a heart attack.

Charlie, a gentle, soft spoken man, was always at our meetings and was a faithful member of the club, having been a member for more years than I can remember. He always tried to help the club in any way he could and recently distributed our auction fliers throughout the state of Connecticut and elsewhere for us. We sure will miss him. Our condolences to his family.

de WA1TBY□

EVENTS

Another interesting technical topic will be covered at the May 1st meeting when our guest speaker will be Bruce Eggers, WA9NEW, who will speak about over the horizon radar (such as the infamous "Russian woodpecker"). He is involved with the U.S. Air Force over the horizon radar development program so his talk should be very knowledgeable and informative. Hope to see you there, May 1st, at 7:30 pm. □

MEETINGS THIS MONTH:

May 1, 1980 at 7:30 pm

May 15, 1980 at 7:30 pm

Intermediate Bldg., Wellesley Hills, Mass.

OFFICIAL BULLETIN

Nr 37, dated April 10, 1980:

The FCC has released a Notice of Proposed Rulemaking, PR Docket 80-136, which proposes to delete the requirement that Amateur Radio stations identify the stations with which they are in contact, unless those contacts involve international third party communications. The Commission is also proposing to require Amateur Radio stations conducting radioteleprinter communications to identify the station with which they are in contact where international third party traffic is involved. Comment deadline is July 16, 1980. Reply comments are due August 15, 1980. Details will appear in June 1980 QST.

Nr 34, dated March 26, 1980:

As announced in the Spring 1980 issue of QCD, there is a change in ARL FIFTY ONE in the list of ARRL Numbered Radiograms, form CD-3. Many traffic handlers have expressed concern over the difficulties caused by the last sentence, "Will let you know when I return." Effective immediately, please DELETE this sentence from ARL FIFTY ONE. Traffic minded Amateurs are reminded that the current list of numbered radiograms is dated October 1979 and supersedes all previous lists. Further comments or suggestions about CD-3 should be routed to ARRL Headquarters. □

hr REPORT

Even Novice ranks grew, as FCC's February 29 totals show the Amateur populations up over a year ago. Extras led, up 9%, but Novices were up 2.4% to 63,372. Advanced were up 2.7%, Generals 3.7%, but Techs only 0.6%. February total was 366,732.

hr Report, March 28, 1980 □

Auctions / Flea Markets

May 4: Flea market and auction. Flea market from 9:30 am to 1 pm, auction from 1:30 pm on. At Knights of Columbus Hall, Columbus Street, Fall River, Mass. (off Meridian Street). Light refreshments on sale. Talk in 146.52, 146.31/91. Bristol County Amateur Radio Association, P.O. Box 112A, Swansea, Mass. 02777.

May 10: The 7th annual Hoss Traders (the biggest and the best) tailgate swapfest, Deerfield Fairgrounds, Deerfield, N.H. (Covered buildings in case of rain). Admission \$1, no commission or percentage. Excess revenues to the Boston Burns Unit of Shriners Hospital for crippled children. Food available. Talk in 146.52 and 146.40/147.00. For questions or a map send SASE to Norm Blake, WA1IVB, P.O. Box 32, Cornish, Maine 04020.

May 17: 76 Flea market and auction. Flea market 10 am to noon, auction noon to 5 pm. Steeres Beach Club, Waterman Lake, Greenville RI. Use I-295 to Exit 78, take Route 44 west 3.4 miles. Talk in 146.16/76 and 146.34/94. Flea market space \$3. Auction 10% commission on all sales except 5% should the item be sold for over \$50.

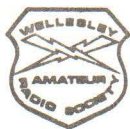
May 18th: 7th annual Eastern Conn. ARC flea market, 9 am to 6 pm. Point Breeze Restaurant hall, Webster, Mass. Food and drink available. Space \$4 in advance, \$5 at the door. Admission \$1. Held rain or shine. Talk in 146.52. Information vis Dick 617-943-4420 after 6 pm. □

ELECTRONIC EXCHANGE

For Sale: HW-101 transceiver with AC power supply, speaker and manual. Asking \$325. Call Steve, N1AOG, at 862-9096. □

The Spark Gap

Official Journal of the Wellesley Amateur Radio Society



EDITOR-IN-CHIEF:

NELS J. ANDERSON, K1UR
32 WESTGATE ROAD, APT. 6
CHESTNUT HILL, MASS. 02167
323-5029

THE "SPARK GAP" IS A MONTHLY PUBLICATION OF THE WELLESLEY AMATEUR RADIO SOCIETY. ITS PRIMARY PURPOSE IS TO KEEP ITS MEMBERS ABREAST OF CURRENT HAPPENINGS, F.C.C. RULES & REGULATIONS CHANGES, AND TO LIST EQUIPMENT OFFERED FOR SALE OR TRADE BY MEMBERS. MEMBERS ARE ENCOURAGED TO CONTRIBUTE TO THE "SPARK GAP" AND MAY SENT THEIR ARTICLES (TYPEWRITTEN IF POSSIBLE) TO THE EDITOR-IN-CHIEF OR TO THE CLUB ADDRESS.

THE WELLESLEY AMATEUR RADIO SOCIETY IS A NON-PROFIT ORGANIZATION DEDICATED TO THE PROMOTION OF AMATEUR RADIO THROUGH INSTRUCTION, FELLOWSHIP, DEMONSTRATION, AND ENCOURAGEMENT OF PARTICIPATION. ANNUAL MEMBERSHIP IN THE SOCIETY IS \$8. THE CLUB YEAR RUNS SEPTEMBER 1 TO AUGUST 31. AMATEUR NOVICE AND GENERAL CLASSES ARE CONDUCTED REGULARLY AT NO COST. TO ENROLL IN A CLASS, OR GAIN INFORMATION ABOUT THE SOCIETY IN GENERAL, WRITE:

THE WELLESLEY AMATEUR RADIO SOCIETY
324 WASHINGTON STREET
WELLESLEY HILLS, MASS. 02181



Minutes

Meeting of March 20, 1980:

The meeting was opened at 7:50 pm by President Bill Downing, WA1PQY.

The minutes of the previous meeting were read.

The issue of whether or not to purchase a repeater antenna and tower was opened for discussion.

Dick Paret, WA1ZLQ, announced that he would begin taking nominations for next year's officers.

The President asked for further volunteers for the Boston Marathon.

Glenn Brodie, N1ACN, asked for volunteers for an antique car race to be held in Wellesley on May 18th.

A site for Field Day was opened for discussion. After voting on several sites, the choice was narrowed down to three, namely Wellesley College, Massachusetts Bay Community College in

Wellesley, and Snow Hill in Dover.

Kevin Kelly, WA1YHV, talked about the auction, to be held on April 12th.

The meeting closed at 9:35 pm.

Meeting of April 3, 1980:

The meeting was opened at 8:45 pm by President Bill Downing, WA1PQY.

The minutes of the previous meeting were read.

A request for people to help with the Bike-A-Thon on May 4th was made.

Don Chesley, WA1HVS, discussed the BAA Marathon.

Kevin Kelly, WA1YHV, discussed the final preparations for the auction.

Nominations for president were reopened due to lack of a candidate.

The treasurer's report was given, and the meeting closed at 8:37 pm. □

Executive Minutes

Meeting of April 2, 1980:

The meeting was opened at 8:42 pm by President Bill Downing, WA1PQY.

The upcoming election of officers was discussed.

Final details of the auction were gone over.

It was announced that the Wellesley Teachers' Association sponsored Bike-A-Thon would require our help on May 4th.

Don Chesley, WA1HVS, attended the recent BAA meetings on the upcoming marathon. Details of the race and arrangements with officials were discussed.

Field Day was discussed briefly.

The meeting closed at 9:38 pm. □

"New Tickets"



Congratulations to Mort Cohen, WB2SBW, on recently upgrading to Advanced Class. Enjoy the low bands, Mort!

Also congratulations to another member of our recent Novice class as Vincent Dwyer has now received his call sign of KA1EQ0.

Anyone else upgrading please let us know. □

OLDE TIME RADIO

by Jim Idelson, K1IR

Part Two

As detailed last month, the experiments of Dr. Frank Conrad at his station 8XK were the beginning of radio broadcasting. As a result of Conrad's success, Westinghouse led by its vice president Harry P. Davis established a station whose call sign became KDKA.

Time was spent and preparations were made for their first broadcast, the results of the Harding-Cox elections on November 2, 1920. Simple receiving sets were manufactured and distributed to special friends and influential Westinghouse officials. Thus the audience was a drafted one, so that more than amateurs alone would hear the broadcasting demonstration.

The station was licensed on October 27, 1920 by the Department of Commerce. The studio/equipment room was constructed hastily atop the tallest Westinghouse building. Mr. Davis described it as a "rough box affair on the roof". The equipment for transmitting had two 50 watt oscillators and four 50 watt modulators. So quickly had the equipment been built that there was barely time on the night of November 1 to make on-the-air tests. The results were unsatisfactory but with proper adjustments made the next day things operated correctly. Conrad was so nervous about the possibility of an equipment breakdown that he spent the entire day at his garage station, 8XK, in case he had to pick up the program in the event of a failure at KDKA.

Under the direction of Dr. Conrad the transmission went well. The returns were telephoned to the studio immediately where the operators put them out over the air in seconds. In some instances the information was received by wireless before it was received on specially installed telegraph wires. Those who did not own receiving sets were able to listen in various ways. In Vandergrift, Pennsylvania, a single receiver was connected

to the local telephone exchange in such a way that those telephone subscribers who made prior arrangements could hear the broadcast in their own homes via the phone. The wire chief gave the results to anyone who inquired as well. Many clubs and auditoriums were equipped with a receiver and a public address system. They combined these two to allow a large number of listeners to hear the results as they were tallied.

Further broadcasts were made from KDKA. The Harding inauguration was broadcast, as well as a series of presidential messages to the public. These events were planned as addresses to assembled audiences, and the presence of a microphone was merely at the folly of the speaker. When it was determined, though, that the effects of the radio transmission were far more widespread than the effects on those present at the address, the microphone became a necessity rather than a novelty. It was Herbert Hoover who first used radio to speak to the public without an audience present at the studio. His address was made in 1921. Hoover also made the first speech over radio with an audience present. He was invited to a dinner in Pittsburgh which was intended to raise money for European post-war relief. Hoover had just returned from a trip to Europe to help provide such relief. KDKA saw that there would be a great deal of public interest in hearing Hoover's comments, so arrangements were made to transmit the speech. This was January 15, 1921. Hoover led the way for other important people such as Alice M. Robertson, the first woman in the United States Congress, Col. Theodore Roosevelt, Jr. and William Jennings Bryan.

A little earlier in December, 1920, KDKA management (Vice President Davis and Station Manager J.C. McQuisten) decided to attempt the broadcast of a church service. One of the Westinghouse engineers was a member of the choir at the Cavalry Episcopal Church in Pittsburgh. Permission was granted and the broadcast was scheduled for January 2, 1921. A great success, this venture set the precedent for many other stations to follow in the future.

(The year 1921 was a time of firsts in the broadcasting industry. More on this next month.) □

THE RECEIVER

by W.R. McIntosh

From the "Lowdown" of the Longwave Club of America)

Part Two

How about the good old days versus now-a-days? In the 1920's a good TRF receiver cost around \$200. In the 1930's and 1940's the better superhets cost about \$350. So with inflation how much does it take today? I'll let you in on a secret. Advancing technology has kept prices down and new features coming. That 1940 receiver did not have a digital frequency readout and frequency calibration was tedious. It required regular maintenance and replacements and produced a lot of heat. While food, clothing and shelter prices have gone up a factor of ten, radio receiver prices have not yet doubled. From \$500 to \$600 will now get a receiver that will beat the \$350 old timer for features, convenience and lower operating and maintenance costs. If you want all the good features of the old timer plus those of the newer sets you may need customizing and I've allowed for that in the prices.

How about the price range of \$50 to \$200 today? Compared to the same prices in the good old days, the modern receivers, particularly the transistor portables, may be had with features never dreamed of long ago. How many VHF and UHF bands did you find on 1940's receivers? How long did those expensive battery packs last on a 1940 tube portable? Could those battery packs be recharged?

For some practical suggestions:

1. Don't buy a new receiver that just came on the market. Allow others to review it, holler at the manufacturer, and try to get an improved product on the market. This happens regularly and is sometimes successful on minor changes.
2. Don't keep spending \$300 trying to get a new receiver that will equal a \$1000 one. By the time you buy and sell several times you will have paid the price of the better receiver but you won't have it.
3. If you try out a synthesized receiver check it for internally generated

hash and birdies. Short the antenna input to chassis ground, turn on the BFO, turn the gain controls up until you have a noticeable noise lever, then search through all the bands for whistles. There will be some. The question is how many and are they strong enough to interfere with regular signal reception? Make certain that strong local broadcast stations are not getting into the receiver even with the input shorted. If they are, the receiver has additional problems of design and shielding. You may not be able to perform these tests meaningfully on a portable or any radio having a built-in ferrite antenna.

To wind up this overlong epistle let me tell you about the one single most common source of trouble about which people contact me--THE POWER PLUG. I am not joking. Folks bring up the weirdest collection of symptoms shown by their receivers or preamplified antennas:

1. Excessive power frequency hum in the audio, often tunable.
2. Dead spots in the tuning.
3. Excessively noisy spots in the tuning.
4. Really overwhelming cases of receiver overloading and intermod that turning down the RF gain won't help.
5. Electrical shocks when they touch the radio.

In some cases they have gone to great trouble and expense to get a good ground connection to the receiver only to find this can make the symptoms worse, not better. In four out of five cases these weird problems are solved by pulling the two-prong power plug from the wall socket, turning it around and plugging it back in again. One side of the 115 VAC line is "hot" and the other side is grounded. If your receiver has an unbalanced power line input (due to line filter capacitors or other components) when you plug it in you may wind up with the chassis "hot" and power line "loops" involving all of your house wiring being coupled into the receiver front-end tuning. Preventing this is fairly simple. Warning: these test procedures which follow may be dangerous to those who do not have sufficient knowledge or are careless.

Get an AC voltmeter that can handle

full line voltage. An inexpensive, accurate AC voltmeter is all that is needed. An inexpensive VOM should do the job. A neon circuit tester will not work--it does not respond to AC voltages as low as those that will be encountered in these tests. Plug in the receiver to the power line, but don't connect anything else to it except maybe a speaker (if your owner's manual tells you this is necessary). Do not connect any antenna or ground to the receiver. Turn the radio on. Measure the AC voltage between a metallic spot on the receiver chassis and a good ground wire lead (run a wire to a metallic cold water pipe if necessary). Do not use a gas line for a ground. Note the AC voltage reading. Then remove the power plug from the wall, turn it over, plug it back in, and note any difference in the AC voltage reading between chassis and ground. There are four possible results you can get:

1. If you have a receiver with a three wire U-ground plug on it and your home is wired properly for three wire U-ground outlets then when you plug in the receiver there should not be any AC potential on the chassis. If there is, then either your home or your receiver is not wired properly. Get help.
2. If your receiver does not have any AC voltage on the chassis when your 2-prong power plug is inserted either way you are in luck, but--check any AC powered accessories before connecting them to the receiver. Hi-fi fans have been using this test for decades. They check AC chassis potential versus plug polarity before they interconnect tuners, amps, phonos, tape recorders, etc. Fidelity is better and noise levels are lower. "Ground loops" are prevented or minimized.
3. If your receiver has about 5 to 50 volts AC on the chassis when the power plug is inserted one way, but zero volts on the chassis when it is inserted the other way, then always plug the receiver in so the chassis AC voltage is zero. Use colored tape, fingernail polish, or something to mark both the line plug and the wall socket so you can make certain something doesn't get changed--as in house cleaning. Once again, check all AC powered accessories before connecting

them to the receiver.

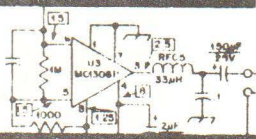
4. If your receiver has an AC voltage (usually 15 to 50 volts) on the chassis no matter which way you turn the plug then you have problems. I have seen military surplus equipment that behaved this way. Don't use this equipment unless the chassis is well grounded, or better yet, modify the equipment to solve the problem. Sometimes this problem can be caused by lousy power supply adaptations. □

CLEARING THE AIR

by Nels Anderson, K1UR

This year on Field Day, the club is breaking away from its tradition of the past few years in that it is not going to a distant site to operate. In the past, the majority have felt it is more enjoyable to travel to some unique location. Still, there has also always been a minority opinion that a disservice was being done to those club members who could not devote an entire weekend to Field Day or otherwise could not or would not travel to a distant site. Here in 1980 this opinion has won out, though there is still a strong desire by some of the more active members to go to an "exotic" site for Field Day (there will in fact be a splinter group who will not take part in the local Field Day).

The decision to stay local was made to cater to the less active club members, to give them an opportunity to participate in this club activity without taking a great deal of time. If you fall into this group you had better take this opportunity to come to Field Day. If it turns out that the majority of club members don't care to come to a local Field Day, it is highly likely that those members who do most of the work will once again opt for a more interesting distant site. If there truly is a group of club members who want a local Field Day, those of you in this group should not fail to take advantage of it, because if you don't, you may not get another chance. □



"Timeout!"

By Mike Adlerstein, K1FB

The following letter was written to Rick Beebe, K1PAD, in response to a request for suggestions to control malicious interference. Hopefully it will stimulate some thought.

Dear Rick,

With reference to your letter regarding malicious interference, it has been my observation that those who cause it fall into two categories:

1. Chronic "sickies" who want attention.
2. Individuals who feel somehow wronged and wish to vent their anger. This is a spur of the moment impulse which can develop into the chronic disease.

The two types of offenders require different handling to minimize their effect on our operations. In both cases the interference should be ignored as much as possible and still maintain communications. When this is not possible, communications should be suspended for a short period rather than raising everyone's blood pressure.

To deal with the chronic offenders, a League appointed committee should be brought into play. The purpose of the committee should be to document, from on the air observations, the offense and offender. The format of this documentation should be prescribed by the FCC and should then be presented to the Commission for its consideration. The FCC should make a well publicized example of offenders in strongly documented cases.

It is clear that during the recent growth spurt of Amateur Radio it has become more difficult for us to self police unless the FCC allows the League to become witnesses to the "crime" whose testimony is acceptable--with proper safeguards.

In any case, some set of guidelines for on the air response to malicious interference should be issued by the League. □

hr REPORT

Increasing congestion on 10 meter's high end is causing confusion and some conflict among users. A long-standing "gentlemen's agreement" has placed FM users between 29.5 and 29.7, OSCAR's downlinks from 29.4 to 29.5 and AM and SSB below 29.4 (though the Russian Amateur spacecraft have also operated just below 29.4). Recently, however, an increasing number of SSB signals have been tearing up FM contacts at the high end as congestion at the lower part of the band has led some operators to seek relief in the "empty" top end.

OSCAR users are in trouble as well, with AM, FM, and SSB from both fixed and mobile stations all competing with CW and SSB satellite downlink signals and 29.4 and 29.5 telemetry during the OSCAR passes. Fortunately, much of the activity above 29 MHz is low power, reducing the interference level, but the basic incompatibility of the various modes makes it an irritating problem even when there's little disruption.

FM users are creating their own interference problems, with many of the fixed frequency older rigs and remote bases set up on the 29.6 MHz national FM calling frequency. After working hours and on weekends, it's next to unusable, and late afternoons the JA QRM often sounds like a DX contest pileup! Increasing use of frequency-agile radios like the FT-901DM and Comtronix FM-80 do enable users to move off 29.6 after establishing contact, but all too often they move up or down onto repeater outputs or inputs or further down into the OSCAR passband.

The top end of 10 meters needs more attention to, and some revision of, the present "gentlemen's agreement" bandplan, before the conflicts cause more problems than they already have.

hr Report, April 4, 1980
(Editor's note: As an OSCAR user, I'm especially concerned with the area from 29.4 to 29.5 MHz. The OSCAR mode A downlink signals are often so weak that they cannot be heard well without a preamp, so any non-satellite

QRM makes copy almost impossible. With passes often less than 20 minutes long it doesn't take much to wipe out all the opportunities for an entire evening. I've seen a writer in another publication go so far as to encourage others to continue operating AM in and near the satellite bands because they have been doing so for years, cannot easily move to another frequency because of their old equipment and because with the bands now being open, 10 shouldn't be used for satellites! It's pretty hard to move a satellite frequency after launch and, at least before WARC, there were not many places that satellites were allowed. So before you start transmitting, think about what you are doing and have some consideration for your fellow ham, whatever band you're on.) □

FROM THE MAILBAG



The Foxboro Company Amateur Radio Club conducts a weekly net at 7:30 pm each Thursday evening on the club repeater (147.975/375).

We call it an "advisory" net, and its main purpose is to inform all Amateurs of any activities, especially those involving emergency communications in the eastern Massachusetts area.

But the net also handles third party traffic into and out of the area, transmits official ARRL bulletins, makes announcements concerning flea markets, auctions, meetings and public service activities.

During the net we also receive local weather reports from all check-ins and have recently added a "swappers" information segment. If you have any Amateur radio gear for sale, or are looking for some piece of equipment, check into the net. You may just find a buyer or seller there and keep informed besides.

We would like to pass this information on to other radio Amateurs and clubs in the area and to any other repeaters you might use. We invite all Amateurs to participate and bring information whether they are Foxco mem-

bers or not. We would like to have as many people check in as possible with us weekly to keep the net going and growing. C U on the net.

de W1XA□

hr REPORT

Complaints to the FCC about Amateur operations have tripled in the past year, and though the Amateur Service is still considered to be probably the best in compliance of all the services administered by the Commission, this rapid increase signals a very alarming trend that shouldn't be allowed to continue. The increase lies principally in two areas: net operations on the hf bands, and on repeaters. In both areas the problem is mainly one of jamming, willful and deliberate interference, an area that's been widely publicized since Southern California Amateurs enlisted the aid of California Congressman James Corman last summer.

A major attack on the interference problem, concentrating in those two areas and likely enlisting the active aid of Amateur observers, is now being prepared within the FCC. Final details of the plan are now being worked out between the participating bureaus, and could be announced as soon as mid April.

hr Report, March 21, 1980

A station identifying as RS3A has been monitored on 29.330 MHz sending a recorded message concerning a ground test of a Soviet RS satellite transponder. The RS3A report says the transponder input is from 145.910 MHz to 145.950 MHz and the output is between 29.410 and 29.450 MHz. The transponder which signs RSØ, also has a beacon with seven channels of telemetry operating on 29.450 MHz. Reception reports for the RSØ ground tests should be sent via Box 88, Moscow; Attention RS3A.

hr Report, March 21, 1980□

BALLOT

This ballot provides for absentee voting for club officers for the club year: 1 September 1980 thru 31 August 1981.

It is certified that the following persons have been nominated for the office shown and that each person has accepted the nomination and will serve if elected.

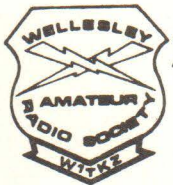
Please vote for only one candidate for each office by putting an "X" in the dashed space before that person's name.

President	_____	David Curry, K1TK
Vice President	_____	Erik J. Thoresen, K1OGF
Recording Secretary	_____	Nels Anderson, K1UR
	_____	Morton D. Cohan, WB2SBW
Corresponding Secretary	_____	Saul Dinman, K1PDX
	_____	William Hanlon, N1ADY
Fund Raising Chairperson	_____	Kevin Kelly, W1YHV
Operating Activities		
Chairperson	_____	Glen Brodie, N1ACN

If this ballot is to be mailed as an absentee ballot, please date and sign the envelope. A ballot mailed with a subsequent date, or a ballot handed in at the election meeting on 15 May 1980, will cancel the earlier ballot.

Please do not sign this ballot to preserve the secrecy of your vote.

The Spark Gap



**WELLESLEY
AMATEUR RADIO
SOCIETY**

324 Washington Street
Wellesley Hills, Massachusetts 02101

MEMBER



Amateur Radio News Service

FIRST CLASS MAIL